

## Exhibit A

## AGRIS record

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**Titles** Physicochemical characteristics of rayon grade dissolving pulp and the effects of metallic-ions on the viscose rayon process

**Personal Authors** Latif, A. (Pakistan Council of Scientific and Industrial Research Labs., Peshawar (Pakistan)); Jan, A.U. (Pakistan Council of Scientific and Industrial Research Labs., Peshawar (Pakistan)); Khan, F.U.; Amin-ur-Rahman

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**English Abstract** Pakistan imports rayon grade pulp from different countries for viscose rayon fibre manufacturing. Samples of imported pulp were collected and analyzed for alpha-cellulose, hemicellulose, calcium, magnesium, silica, copper, manganese, and iron. Moisture, ash content, cuprammonium viscosity, degree of polymerization, alkali absorption, and colour brightness were also determined. The results showed that all these parameters varied from sample to sample. The cotton linter pulp contained high alpha-cellulose content (94-98%) as compared to the softwood pulp (89.7-95%). Degree of polymerization of all samples was above 500 and varied from 500-750 ml/g. The study showed that higher manganese and copper content in cotton decreased the degree of polymerization. Iron above the standard value (7-10 ppm) affected the brightness of fibre, as observed in the case of cotton linter pulp (imported from China). The percentage of ash was less than 0.25% in all the samples studied.

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For document availability, please contact:

*DSINARC/PK (Pakistan)*

*Islamabad, Pakistan*

**Contact:** Ms Shahnaz ZUBERI

**Tel:** +92 51 9255033; 51 9255061

**Fax:** +92 51 0255934

**Email:** [dsinarc@comsats.net.pk](mailto:dsinarc@comsats.net.pk); [dbsnarc@isb.paknet.com.pk](mailto:dbsnarc@isb.paknet.com.pk)

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